camera, an ambient light sensor, and a proximity sensor. The electronic device use one or more of the camera and the proximity sensor to emit light into a body part of a user (such as a finger, and ear, and so on) touching a surface of the electronic device. The electronic device may use one or more of the camera, the ambient light sensor, and the proximity sensor to receive at least part of the emitted light reflected by the body part of the user. The electronic device may compute health data of the user based upon sensor data regarding the received light. In this way, the health data of the user may be detected utilizing an electronic device including a camera, ambient light sensor, and proximity sensor without making the user obtain access to a dedicated fitness and/or wellness device.

In the present disclosure, the methods disclosed may be implemented as sets of instructions or software readable by a device. Further, it is understood that the specific order or hierarchy of steps in the methods disclosed are examples of sample approaches. In other embodiments, the specific order or hierarchy of steps in the method can be rearranged while remaining within the disclosed subject matter. The accompanying method claims present elements of the various steps in a sample order, and are not necessarily meant to be limited to the specific order or hierarchy presented.

Techniques detailed in the described disclosure may be provided as a computer program product, or software, that may include a non-transitory machine-readable medium having stored thereon instructions, which may be used to program a computer system (or other electronic devices) to perform a process according to the present disclosure. A non-transitory machine-readable medium includes any mechanism for storing information in a form (e.g., software, processing application) readable by a machine (e.g., a computer). The non-transitory machine-readable medium may take the form of, but is not limited to, a magnetic storage medium (e.g., floppy diskette, video cassette, and so on); optical storage medium (e.g., CD-ROM); magneto-optical storage medium; read only memory (ROM); random access memory (RAM); erasable programmable memory (e.g., EPROM and EEPROM); flash memory; and so on.

It is believed that the present disclosure and many of its attendant advantages will be understood by the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the components without departing from the disclosed subject matter or without sacrificing all of its material advantages. The form described is merely explanatory, and it is the intention of the following claims to encompass and include such changes.

While the present disclosure has been described with reference to various embodiments, it will be understood that these embodiments are illustrative and that the scope of the disclosure is not limited to them. Many variations, modifications, additions, and improvements are possible. More generally, embodiments in accordance with the present disclosure have been described in the context or particular embodiments. Functionality may be separated or combined in blocks differently in various embodiments of the disclosure or described with different terminology. These and other variations, modifications, additions, and improvements may fall within the scope of the disclosure as defined in the claims that follow.

I claim:

1. A mobile personal computing device, comprising:

a camera;

an ambient light sensor;

a proximity sensor; and

a processing unit communicably coupled to the camera, the ambient light sensor, and the proximity sensor;

wherein the processing unit is configured to:

use the camera and the proximity sensor to emit light into a body part of a user touching a surface of the mobile personal computing device;

use at least one of the camera, an ambient light sensor, or the proximity sensor to receive at least part of the emitted light reflected by the body part of the user and generate sensor data; and

compute health data of the user, utilizing the processing unit, using at least the sensor data regarding the received light.

2. The mobile personal computing device of claim **1**, wherein the camera, the ambient light sensor, and the proximity sensor are positioned to be at least partially covered by the body part of the user at a same time.

3. The mobile personal computing device of claim **1**, wherein the proximity sensor is configured to detect multiple wavelengths of light.

4. The mobile personal computing device of claim **3**, wherein multiple light wavelength proximity sensor is configured to emit and receive infrared and visible light.

5. The mobile personal computing device of claim **3**, wherein multiple light wavelength proximity sensor is configured to emit and receive infrared and red light.

6. The mobile personal computing device of claim **1**, wherein the ambient light sensor is a at least one of a silicon ambient light sensor or an indium gallium arsenide ambient light sensor.

7. The mobile personal computing device of claim **1**, wherein the camera is configured to detect infrared light.

8. The mobile personal computing device of claim **1**, wherein the device is configured to compute the health-related information when the body part of the user is positioned at least partially over the camera, the ambient light sensor, and the proximity sensor.

9. The mobile personal computing device of claim **1**, wherein the processing unit utilizes the camera to determine when the body part of the user is misaligned with the camera, the ambient light sensor, and the proximity sensor for purposes of detecting the information about the body part of the user.

10. The mobile personal computing device of claim **9**, wherein the processing unit provides an output that can be used as guidance to correct a misalignment.

11. The mobile personal computing device of claim **10**, wherein the processing unit is configure to provide the output to at least one visual output component, audio output component, or haptic output component.

12. The mobile personal computing device of claim **1**, wherein the camera is configured with a focal distance greater than a distance between the camera and the body part of the user when the body part is touching the surface of the mobile personal computing device.

13. The mobile personal computing device of claim **1**, further comprising

electrical contacts disposed on an exterior surface of the device, wherein the processing unit is further configured to compute additional health-related information regarding the user based on an electrical measurement obtained using the electrical contacts.

14. The mobile personal computing device of claim **13**, wherein the electrical contacts are positioned to contact the body part of the user and an additional body part of the user.